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Amperometric biosensor for determining lead and cadmium

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Abstract

A method for the determination of lead and cadmiun in plant leaves and the semiquantitative determination of these metals in soils using an amperometric tissue biosensor based on cucumber leaves is proposed. The effect of lead and cadmium ions on the enzymatic hydrolysis of cysteine has been studied in the presence of L-cysteine desulfhydrolase from cucumber leaves. It has been found that ions of these metals have an inhibiting effect on the enzyme of cysteine metabolism. This effect is proportional to the metal concentration and the time of treating the biosensitive part of the biosensor with the salts of these metals. The detection limits for cadmium and lead attained with the proposed sensor are 1 × 10-8 and 3 × 10-8 M, respectively.